Claims

1.   A method for the estimating of the residual service life of an appa-
ratus which is subjected to a wear during operation, with the fol-
lowing steps:

    a) for at least one characteristic parameter (T) which is sensitive to
the wear (V), a relationship is determined to a time parameter (A)
which is representative for the operating period;

    b) a limit value (G) is fixed for the characteristic parameter (T) which
gives the maximum permitted wear;

    c) a code field (KF) is established which gives a relationship between
the characteristic parameter (T), the time parameter (A) and the
wear (V);

    d) actual values are determined for the characteristic parameter (T)
in dependence on the time parameter (A) with the aid of data ob-
tained by a measurement;

    e) the instantaneously present wear (V) is determined from the
actual values with reference in each case to the code field (KF);

    f) starting from the instantaneous actual value of the characteristic
parameter (T), a determination is made by means of extrapolation to
the limit value (G) of the end value of the time parameter (A) for
which the maximum permitted wear is reached;

    g) the residual service life (RL) is estimated by a comparison of this
end value with the value for the time parameter which belongs to
the instantaneously present wear.

2.   A method in accordance with claim 1, in which the code field (KF) is
established with the aid of a-priori knowledge of the wear behav-
iour.

3.   A method in accordance with claim 2, in which the a-priori knowledge includes the qualitative and/or quantitative course of wear curves (K1, K2, K3, K4) which give the relationship between the characteristic parameter and the time parameter.

4.   A method in accordance with any one of the preceding claims, in which the code field (KF) is established by means of a linguistic fuzzy model.

5.   A method in accordance with any one of the preceding claims, in which the code field (KF) is modified with reference to measurement data or on the basis of plausibility observations.

6.   A method in accordance with any one of the preceding claims, in which the code field (KF) represents an area in a three-dimensional space which space is set up by the characteristic parameter (T), the time parameter (A) and the wear (V).

7.   A method in accordance with any one of the preceding claims, in which the data obtained by a measurement is subjected in each case to a filtering or an averaging for the determination of the actual values for the characteristic parameter.

8.   A method in accordance with any one of the preceding claims, in which a model is established with the aid of a plurality of sets of data obtained by a measurement, with which model an actual value is determined for the characteristic parameter.

9. A method in accordance with any one of the preceding claims, in which the apparatus is an engine, in particular an aeroplane engine.

5 10. Use of a method in accordance with any of claims 1 to 9 for the service planning, in particular of an aeroplane or of a plurality of aeroplanes.